



REVOLUTIONIZING WARFARE THROUGH INTERDICTION

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THE JOINT surveillance and target attack radar system (JSTARS) promises to revolutionize how US forces conduct conventional warfare. Before the development of JSTARS, US forces depended on close operations to defeat an enemy army. Because airpower's ability to destroy an enemy's mobile ground forces was severely limited, especially during darkness and bad weather, interdiction proved important to close operations—but in a supporting role—primarily by delaying and disrupting enemy maneuver and resupply. ¹ Now, however, JSTARS and developments in precision guided munitions (PGM) will permit a commander to use interdiction to quickly destroy large numbers of an enemy army's vehicles, even during darkness and bad weather. Interdiction's vastly increased destructiveness against mobile forces will revolutionize the conduct of warfare by giving

airpower a much more direct role in the defeat of an enemy army. Although close operations will still be necessary, friendly ground forces will most likely sustain significantly fewer casualties. Examining the role of interdiction in past wars will help explain why JSTARS is the key to revolutionizing warfare through interdiction.

Interdiction: A Historical Perspective

By the time US forces began fighting in North Africa in World War II, military leaders such as Gen Dwight D. Eisenhower had come to recognize the importance of interdiction. Their perspective is reflected in US Army Field Manual (FM) 100-20, *Command and Employment of Air Power* (21 July 1943), which es-

established interdiction as the second priority (after air superiority) of tactical (theater) airpower. The manual made close air support the third priority, explaining that “in the zone of contact, missions against hostile units are most difficult to control, are most expensive, and are, in general, least effective. Targets are small, well-dispersed, and difficult to locate. In addition, there is always a considerable chance of striking friendly forces.”²

Remarks by Field Marshal Erwin Rommel, the enemy commander in North Africa who was on the receiving end of Allied airpower, appear to confirm the importance of interdiction. According to Rommel, “the first essential condition for an army to be able to stand the strain of battle is an adequate stock of weapons, petrol and ammunition.”³ Reflecting on why he lost the Battle of El Alamein, the German general wrote that if the enemy has air superiority, he can “strangle one’s supplies, especially if they have to be carried across the sea.”⁴

As Rommel discovered, Allied interdiction proved very effective in destroying supplies and reinforcements as they crossed bodies of water. Interdiction was able to destroy enemy forces at sea because of the environment’s effect on the search for targets. Specifically, the water’s relatively smooth surface not only facilitated visual searches, it also made radar an extremely effective means for finding ships—even during darkness and bad weather.

In contrast, interdiction’s ability to destroy enemy forces on land was far more limited, in large part because of the immense difficulties airmen experienced in their search for those forces. Unlike the situation at sea, airmen could not use radar to find ground forces since the complexity of the land’s surface created so much clutter that radars available in World War II, Korea, and Vietnam were completely ineffective for finding objects as small as trucks or tanks. Visual search was the *only* means airmen had for finding the enemy’s mobile ground forces.

Visually searching for targets severely limited airpower’s effectiveness. Since a visual search depended on good weather and—in most cases—daylight, airmen often were unable to make a search at all. Good weather and daylight permitting, many aircraft had to fly continuously over an area to improve their chances of finding targets. Even under ideal conditions, a number of these aircraft would find no suitable targets before running low on fuel. In this case, aircrews would either attack a prebriefed secondary target or return to base with their munitions. Adding to the problem of making a visual search was the danger from enemy air defenses. The low altitudes and airspeeds that helped in locating ground forces also increased the vulnerabil-

ity to attack by enemy aircraft and surface-based air defenses.

Unfortunately for airmen, the same terrain that made radar ineffective for finding ground forces could also be exploited by those forces to make visual searching much more difficult. Soldiers could significantly increase airmen’s problems by using concealment, camouflage, deception, and dispersal. Although these measures were effective, soldiers quickly realized that the best way to reduce their chances of being destroyed by airpower was to move only at night or during bad weather, when visual searches proved extremely difficult, if not impossible, for airmen.

Thanks to these countermeasures, effective interdiction against land forces has usually depended on synchronizing inter-

diction, either by accident or by commander’s design, with the actual or potential maneuver of powerful friendly ground forces. Synchronization created an unsolvable dilemma for enemy commanders. If they attempted to use rapid ground maneuver to defeat friendly ground forces, they usually moved their forces—often in lucrative concentrations—into the open during daylight and good weather, when interdiction’s chances of success were greatest. In contrast, to reduce the chance of having their ground forces destroyed by air attack, enemy commanders had to move them only during darkness or bad weather. Such a limitation prevented commanders from maneuvering as fast as would otherwise have been possible. Since enemy commanders almost always chose to preserve their troops, interdiction’s main contribution to success in most campaigns lay in delaying and disrupting enemy maneuver and resupply.

Allied operations during and after the invasion of France in 1944 illustrate the effectiveness of synchronization when friendly ground forces go on the offensive. German commanders, who depended on maneuvering their forces rapidly from one area to another to contain the invading Allies, faced the dilemma mentioned above. That is, Allied interdiction made any attempt to move during the day extremely dangerous. To avoid destruction, German commanders accepted delays by restricting their maneuver to nighttime. Exploiting the inability of the German army to maneuver quickly, the Allies massed their ground forces and, after very hard fighting, achieved a breakout that the Germans could not contain.

The Battle of the Bulge shows that interdiction could also create a dilemma when friendly ground forces assumed a defensive posture. Protected from Allied air interdiction by winter weather and long nights, the German offensive that began 16 December 1944 initially made significant progress against Allied

ground forces. On 23 December, however, the weather cleared, allowing Allied fighter-bombers to fly thousands of interdiction sorties. Soon, according to the artillery commander of the Fifth Panzer Army, "attacks from the air by the opponent were so powerful that even single vehicles for the transport of personnel and motorcycles could only get through by going from cover to cover."⁵ With interdiction severely handicapping the German army's maneuver and resupply, Allied armies had time to recover and soon were able to concentrate powerful forces that stopped the German offensive, although at a very high cost in friendly lives.

The Korean and Vietnam wars provide still more examples of the effectiveness of interdiction synchronized with ground maneuver. On three occasions in 1950, interdiction demonstrated that its threat of destruction was sufficient to cause enemy commanders to limit their maneuver and resupply to the hours of darkness or periods of bad weather: (1) during the initial North Korean invasion;⁶ (2) before and during the breakout by United Nations (UN) ground forces from the Pusan Perimeter;⁷ and (3) during the Chinese Communists' pursuit of withdrawing UN forces.⁸ In Vietnam the same principle held true when the North Vietnamese army launched a powerful offensive in 1972, employing numerous trucks, tanks, and artillery pieces.⁹

World War II, Korea, and Vietnam all demonstrated that interdiction's main contribution to success was *not* the destruction of enemy forces but the delay and disruption of their maneuver and resupply. Even so, defeat of the enemy army still required that

very large, powerful friendly ground forces engage the enemy in close operations, in which friendly forces often suffered many casualties.

Operation Desert Storm: The Beginning of the Revolution

In 1991 came the first signs of a revolution in the conduct of warfare. These signs arose during the Gulf War, when the Iraqis made the shocking discovery that coalition aircraft could find and destroy their vehicles, even if they moved only at night. In fact, interdiction caused so much destruction that it was a key factor in the coalition's ability to defeat the Iraqi army at a cost of far fewer friendly casualties than the number predicted by military experts. Of course, these experts had been thinking of interdiction only in terms of its ability to delay and disrupt enemy maneuver and resupply.

Part of the reason for interdiction's vastly improved ability to destroy vehicles has to do with developments in PGMs and night-vision technology, which allow airmen to inflict significant damage and do so with fewer weapons and sorties. However, since only a relatively small number of coalition aircraft were equipped with night-vision systems or could deliver PGMs (not to mention the fact that PGMs require good visibility), these developments alone are not sufficient to explain why interdiction was so much more effective at destroying ground forces.

Given the vast size of the theater and the relatively small number of aircraft performing interdiction at night, the prototype E-8A JSTARS aircraft was often



The destruction of Iraqi mechanized forces at Al Khafji and scenes like this along the Euphrates River appear to have convinced Iraqi army commanders of the futility of maneuvering in the face of the threat of interdiction.

the only reason that coalition airmen were able to find Iraqi vehicles. The unprecedented performance of JSTARS provided coalition commanders with near-perfect information in real time on all significant vehicular movement within its very large coverage area (assuming such movement was not screened by terrain or foliage). The ability of JSTARS to detect, locate, and accurately track the movement of vehicles, even during darkness and bad weather, ensured excellent situational awareness by allowing commanders to detect developing threats and exploit opportunities in time for airpower to respond with appropriate interdiction missions. Moreover, JSTARS provided target cueing and battle management, which dramatically multiplied interdiction's effectiveness at the same time it decreased the risk of losses by reducing aircraft exposure to enemy air defenses. In fact, contrary to previous experience with interdiction at night, aircraft ran out of weapons long before they ran low on fuel.¹⁰

Although interdiction controlled by JSTARS was responsible for destroying a significant portion of the Iraqi force, its most important effect on the campaign was psychological. As Iraqi soldiers discovered the adeptness of coalition airmen at finding and destroying their vehicles and heavy weapons—even in darkness—interdiction began to cause such fear that many Iraqi units disintegrated.¹¹ The Iraqi army's only major offensive operation—the battle at Al Khafji—clearly demonstrates interdiction's ability to cause military disintegration.

On the night of 29 January 1991, JSTARS detected elements of two Iraqi heavy divisions—the 5th Mechanized and 3d Armored—moving toward coalition positions at Al Khafji. Exploiting the unprecedented situational awareness of JSTARS, coalition leaders quickly concentrated airpower in the form of A-10s, AC-130s, AV-8Bs, F/A-18s, and armed helicopters against the advancing Iraqi forces. Maneuvering in the open, the enemy's ground forces were now far more vulnerable to air attacks than when they were dispersed and protected by revetments. Three days later, more than 1,000 sorties had caused immense damage to the two Iraqi divisions. As one Iraqi veteran noted, at Al Khafji his brigade had suffered more damage in 30 minutes than it had in eight years during the Iran-Iraq War.¹²

Al Khafji appears to have convinced many Iraqi army commanders of the futility of maneuvering in the face of the threat posed by coalition interdiction. Thus, the Iraqis were unwilling to mount an effective defense, let alone engage in offensive operations. For low-ranking Iraqi soldiers, the threat of interdiction—including nighttime "tank plinking" by F-15Es and F-111Fs—

became so terrifying that they refused to drive their trucks and avoided tanks and other equipment believed to be targets.¹³ The fear created by interdiction does much to explain why the Iraqis abandoned so many of their vehicles and weapons.¹⁴ It also helps explain the brevity of the ground campaign and the fact that coalition ground forces sustained so few casualties.

JSTARS: The Key to an Interdiction Revolution

As the twenty-first century approaches, the powerful synergy created by JSTARS and weapons such as brilliant antitank (BAT) submunitions, which are able to destroy moving vehicles even during darkness and bad weather, will allow the US military to revolutionize its conduct of warfare. By exploiting the unprecedented operational- and tactical-level situational awareness provided by JSTARS, a US commander will be able to synchronize ground maneuver and interdiction so that interdiction becomes the primary instrument for destroying an enemy army.¹⁵ In these circumstances, the commander would use information provided by JSTARS to maneuver ground forces to force the enemy army to move and therefore make it easy for JSTARS to detect and then direct air attacks against the enemy's vehicles. To ensure low casualties, a commander could also use JSTARS information to maneuver ground forces to reduce their exposure to the enemy's artillery and lower the risk of close operations with intact enemy units. After using interdiction to destroy the enemy's vehicles, a commander could then use JSTARS information to maneuver ground forces to finish off the enemy army and occupy key objectives without fear of sustaining many casualties.

The unprecedented ability of interdiction under JSTARS battle management to destroy an enemy army's vehicles whenever they attempt to move is extremely important in revolutionizing how the US conducts warfare. Such destruction will quickly deny the enemy army commander the ability to maneuver, employ heavy weapons, and resupply forces. *In fact, this destruction would merely be a means to an end.* Moreover, depending on how skillfully a US commander uses the situational awareness from JSTARS to orchestrate the employment of precision weapons, in all likelihood only a small fraction of the enemy army's vehicles need be destroyed to achieve success. Further, the destruction of these vehicles probably would not kill many enemy soldiers. More importantly, targeting enemy military vehicles greatly reduces the risk to civilian lives and infrastructure.

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Fear explains how interdiction can achieve success without inflicting immense physical destruction and loss of life.¹⁶ Enemy soldiers who survive sudden, violent interdiction attacks that can occur at any time become fearful of further attacks. As airpower continues to demonstrate its uncanny ability to find and destroy vehicles whenever they move, *no matter what measures the enemy takes*, the enemy's terror should continue to grow. Before long, this fear becomes so acute that enemy soldiers, even those who have not yet been attacked, become disoriented and unwilling to remain near their vehicles.¹⁷

As news of the destruction caused by interdiction spreads, the morale of an enemy army will likely become more fragile and easily shattered, especially when soldiers recognize that losing their mobility, firepower, and supplies guarantees defeat. Morale would then plummet as increasing numbers of soldiers witness attacks that prove interdiction's unprecedented ability to destroy their vehicles. Once enough enemy troops believe that continued resistance is useless, their units will disintegrate. At this point, a commander can easily use maneuver and close operations to complete the enemy army's defeat at a very low cost in terms of friendly casualties—as was the case during Desert Storm. Moreover, even before military disintegration occurs, interdiction is likely to achieve sufficient destruction to ensure that the enemy army poses little offensive threat.

The revolution in the conduct of warfare that JSTARS makes possible provides a truly immense opportunity for the US to help maintain international peace. The greatly increased (but very precisely focused) destructiveness of interdiction controlled by JSTARS should prove sufficient to deter most potential aggression. Adding to the strength of this deterrence, the comparatively low cost in terms of resources and lives (both friendly and enemy, military and civilian) of employing interdiction should make it much easier for US leaders to maintain strong domestic support for a policy of using force to prevent aggression.

Notes

1. Interdiction is defined in Joint Pub 1-02, *Department of Defense Dictionary of Military and Associated Terms*, 1 December 1989, as "an action to divert, disrupt, delay or destroy the enemy's surface military potential before it can be used effectively against friendly forces" (187).
2. US Army Field Manual 100-20, *Command and Employment of Air Power*, 21 July 1943, 10–11.
3. B. H. Liddell Hart, ed., *The Rommel Papers* (New York: Harcourt, Brace, 1953), 328.
4. Ibid.
5. Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, vol. 3, *Europe: Argument to V-E Day, January 1944 to May 1945* (1951; reprint, Washington, D.C.: Office of Air Force History, 1983), 695.
6. Robert F. Futrell, *The United States Air Force in Korea, 1950–1953*, rev. ed. (Washington, D.C.: Office of Air Force History, 1983), 33, 85, 171–75.
7. Ibid., 162–75, 207–14.
8. Ibid., 242–46.
9. For an excellent treatment of airpower's role in the defeat of the Easter Offensive, see Dale Andrade, *Trial by Fire: The 1972 Easter Offensive, America's Last Vietnam Battle* (New York: Hippocrene Books, Inc., 1994). See also W. Scott Thompson and Donaldson D. Frizzell, eds., *The Lessons of Vietnam* (New York: Crane, Russak, 1977), 160.
10. Richard P. Hallion, *Storm over Iraq: Air Power and the Gulf War* (Washington, D.C.: Smithsonian Institution Press, 1992), 220. See also William L. Smallwood, *Strike Eagle: Flying the F-15E in the Gulf War* (Washington, D.C.: Brassey's, Inc., 1994), 177–83.
11. "Military disintegration is a condition of organizational paralysis characterized by the total and often sudden collapse of the willingness of the average soldier to resist or to attack the enemy. . . . Once organizational control over the fighting ceases, and combat becomes a matter of individual survival, disintegration has occurred." Stephen D. Westbrook, "The Potential for Military Disintegration," in *Combat Effectiveness: Cohesion, Stress, and the Volunteer Military*, ed. Sam C. Sarkesian (Beverly Hills, Calif.: Sage Publications, 1980), 244.
12. Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey*, vol. 2, *Operations and Effects and Effectiveness* (Washington, D.C.: Government Printing Office, 1993), 239–40.
13. Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey: Summary Report* (Washington, D.C.: Government Printing Office, 1993), 97, 108.
14. Ibid., 109–10, 116–17.
15. "Synchronizing interdiction and maneuver (both land and sea) provides one of the most dynamic concepts available to the joint force. . . . JFCs [joint force commanders] may choose to employ interdiction as a principal means to achieve the intended objective. . . . Indeed, JFCs may em-

ploy a scheme of maneuver that enhances interdiction operations or vice versa." Joint Pub 3-0, *Doctrine for Joint Operations*, 9 September 1993, IV-19 and IV-21.

16. Many military analysts devote insufficient attention to the impact of fear, but as Carl von Clausewitz noted, "Without an accurate conception of danger we cannot understand war." *On War*, ed. and trans. Michael Howard and Peter Paret

(Princeton, N.J.: Princeton University Press, 1976), 114.

17. For an excellent treatment of this phenomenon, see Col Robert H. Scales, Jr., "Firepower: The Psychological Dimension," *Army*, July 1989, 43-50; and Ian Gooderson, "Allied Fighter-Bombers versus German Armour in North-West Europe, 1944-1945: Myths and Realities," *Journal of Strategic Studies*, June 1991, 210-31.

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